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The Federal Communications Commission in 1938 set aside AM radio assignments for future educational stations. In the 1960's it made additional assignments for education: long-range FM radio, multiplex sub-carrier channels; and UHF, VHF, and Instructional Television Fixed Service channels for statewide ETV broadcast service. Such networks aid the industry of a state and provide inservice training, administrative discourse, and educational and cultural opportunities. The National Defense Education Act (1958, Title VII) initiated federal support for research to measure the effectiveness of television as an instructional medium for training of ETV personnel. The Educational Television Facilities Act (1962), Higher Education Act (1965), and Elementary and Secondary Education Act (1965) supplied federal funds to ETV stations for programing. Today 124 educational television stations broadcast noncommercial programs in 38 states. Federal money supports state and local ETV programs designed to improve professional training and media techniques. The interdependence of ETV and computer facilities promises electronic backbone systems in statewide communications. (TI)

Federal-State Relationships

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Prepared for the Feasibility Study of Inter-Institutional Television • University of Minnesota, Minneapolis, Minnesota

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Federal-State Relationships
Educational Television Broadcasting

For over a decade educational television (ETV) broadcasting has grown steadily in facilities and services. Through tests and demonstrations television's effectiveness in education is better understood as are the implications of these experiences for the United States and the World.

President Johnson in his Pacific trip viewed the television centered education system in American Samoa, still less than three years old. On his return to Washington he announced his intention to appoint a committee to study how the benefits of educational television broadcasting could be extended to the underdeveloped countries of the world.

A few months ago the Ford Foundation created a stir by advocating finance of a domestic communication satellite project which would provide for television links to noncommercial television stations, elementary and secondary schools, and institutions of higher education. The satellite transmission services were to be financed from savings gained in providing station interconnection services for the three commercial networks. 1/ For most people the future had not seemed that close.

1/ The Ford Foundation proposes four satellites each containing 12 television channels. One satellite would serve each time zone. In each zone there would be 11 television channels, six to be used for the network requirements of the three commercial networks, three for primary and secondary school instruction, one for university level instruction, and one for noncommercial cultural network programs. The plan assumes 750 receiving locations, one at each broadcast station using the system and would provide for 20 major sending locations and 525 mobile or special sending locations. Capital cost is estimated at $80 million and operating cost (for the transmission system not for program production) is estimated at $19 million. An expansion inservice is projected which would provide for an increase in primary-secondary school channels from three to seven with two university channels rather than one.

In Boston, the Carnegie Commission on Educational Television, a blue ribbon group headed by Dr. James Killian, former science advisor to President Eisenhower and head of the Massachusetts Institute of Technology, was completing a study of educational television broadcasting and preparing recommendations which promised to have major impact on the scene.

On the industrial front, there have been a rash of mergers and purchases over the last eighteen months through which major corporations in the field of communications have brought together the diverse industrial and marketing capabilities required to compete in an educational world where moving images, sounds, and the printed page will be planned and developed together to achieve educational objectives, heretofore beyond our capacity.

While we have only begun to understand how to utilize television for education, these actions along with others indicate the great weight accorded television as a force for human development. Television can be used for a great range of organized endeavors. It is capable of many kinds of services and cuts across many established institutional lines. It does not, therefore, fall easily into established patterns of thought. Television, when used for other than commercial broadcasting purposes, has an identity problem.

Most Americans use the term "television" to refer to commercial television broadcasting--entertainment programs, interspersed with advertising messages, and created for broadcast to mass audiences. For most, ETV represents an alternative, cultural entertainment and public information programs without advertising. Probably, the experience of the community with television entertainment has slowed innovation in the use of television for purposes of work.

Nevertheless, television is being used increasingly to do tasks better. Wherever we need to see what cannot be seen, television technology may have utility.

The methods by which images and sound are delivered are many, ranging from the great television broadcast station to the small cartridge playback unit carried by the teacher, health professional or agricultural extension agent.

The lens of a television camera may be extended into the body and a view provided for consulting physicians of the surface of an organ deep within. In the not far distant future it will be possible to transmit that view between continents by satellite.

Today, some of the most time-consuming travel is to nearby towns. We can travel in comfort to Europe in less time than it may take to travel in discomfort to locations within a State. Through State television systems, two-way radio and other techniques, time and distance can disappear. Costly and time-consuming workshops are supplemented as information is brought to professionals rather than requiring them to come to central locations. Even within limited areas, television's ability to extend sight is highly desirable. Law enforcement officers in New York City use television to bring the police lineup to the precinct station rather than have officers go to the lineup. Students at far corners of a room may observe a slide beneath the microscope lens as well or better than those near the demonstration table. Television technology is relevant to any human endeavor which can benefit by the communication of images and sounds over distances.

For purposes of planning it is useful to divide consideration of television transmission systems into two types, broadcast or public systems and institutional or private systems. Broadcast television provides

a signal over broad areas and is picked up by easily available, moderately priced receivers. The institutional systems require special, planned receiving locations, usually relatively costly. There is limited access to the TV signal which is directed or controlled and not generally available to the public.

The subject of this paper is broadcasting. Our principal concern will be noncommercial television, although noncommercial radio broadcasting will be covered as well.

Major television transmission systems, either institutional or broadcast, require substantial investments. The opportunity for educational broadcast systems furthermore, is limited by availability of radio spectrum space. States can at best have only two noncommercial educational broadcast channels, and it is more likely that only one state-wide broadcast service is possible.

Both its cost and the difficult problems of organization require that the television broadcast system receive careful planning and phased development. A substantial period for growth is necessary before a television system can begin to fulfill its potential for service. The physical system must exist before it can be used. Until it is available institutions and agencies do not organize to use it. Once used, a learning period is needed for creative application. To build television into the established program of a public service agency requires time and long-range planning. Nevertheless, noncommercial broadcast facilities are growing each year, and the use of these facilities for health, education, and community services is growing also.

The purpose of this paper is to examine noncommercial broadcast services from the viewpoint of a State seeking to improve the condition

of life for its citizens through quality education, economic development, and efficient and effective public services.

After describing the current status of noncommercial broadcast services, the partnership role of the Federal government will be examined followed by a discussion of embryonic State efforts to plan for the total communication systems development, in which educational television broadcasting has a significant role.

Current Status of Noncommercial Broadcasting

Today there are 124 educational television (ETV) broadcast stations operating in 38 States. Some 28 additional stations are under construction and within a year it is expected that only 3 States will be without an ETV broadcast station--Alaska, Montana, and Wyoming. Currently, ETV is available to areas with potential home audience in execss of 140 million people. (At the same time that educational television broadcasting is expanding, closed-circuit television systems are being installed in increasing numbers. These vary in size from systems involving the wiring of a few rooms for television to Statewide systems involving the interconnection of the public school system for the reception of televised instruction.)

Licensing and control of the 124 noncommercial educational television broadcast stations are divided almost equally among public schools, universities, State agencies, and non-profit community corporations. Station WNYC-TV in New York City is the single noncommercial station licensed to a municipality.

In practice educational television broadcasting performs a variety of functions. Stations program for in-school instruction, college course

work, continuing education for professionals, job training, personal improvement, community development, general cultural entertainment and public affairs information.

It is estimated that one-third of ETV programing nationally is devoted to in-school instruction. Science and mathematics lead among subjects broadcast, taking up one-third of the elementary and secondary broadcast schedule, with social science, foreign languages, English language, music, art, and literature following in that order.

Approximately one-seventh of educational broadcasting is taken up by college level instruction, one-half of this in the evening. Since it brings programs into the home or place of work, ETV can be a valuable asset to adult extension services. It was recently reported that 169 inmates of Illinois State Penitentary were students in Chicago's TV Junior College, each taking from 15 to 19 semester hours of educational television.

Continuing education for professionals and various forms of job training represent growing areas of programing. Instruction is designed to assist a wide range of occupations including doctors, nurses, business managers, foremen and lawyers. Job training by television is expanding much of it initiated by private industry. The American Management Association provides management training through nine major ETV stations, for example.

Some programs serve administrative purposes. One of the principal functions of New York's WNYC is dissemination of information and training to public employees and to regulated occupations such as the staff of privately operated nursing homes. Broadcast television is used by the

departments of police, fire, hospitals, health, and education, to provide both internal administrative communication and information to the residents of New York City.

Cultural and public information programs dominate the evening broadcast schedule. About one-half of these programs are provided by National Educational Television (NET), the national network of ETV stations. In addition, the cultural programs of regional and State networks, and university production centers are widely used. Motion pictures are being telecast by some stations as are cultural programs produced for commercial stations. Foreign television programs are being repeated through international agreements. Public informaion programing is continuing to expand.

The ETV program is to be judged by the value to the community of the change in behavior accomplished, not by numbers of viewers. The 4,000 nurses receiving in-service training in a major metropolitan area is not large by commercial television standards. However, when the value to society of the knowledge gained is considered, the size of the audience is secondary. The commercial television station cannot operate successfully without large audiences. The mass audience, attracted through the medium of entertainment, is the goal of the commercial television station. Its function is to create mass markets for mass production. Educational television stations however are able to operate and yet distribute materials of interest to small audiences.

Inherently noncommercial radio stations represent a versatile and low cost method for providing knowledge in the home, car, and place of work.

In January 1921, WHA, of the University of Wisconsin, the first noncommercial radio station, began operating. By 1925, 171 of the 571 stations on the air were operated by educational institutions. Only 38 stations, by 1937, had been able to survive the pressures of the depression and the radio education movement seemed near an end. Today, however, there are 312 educational radio stations in operation. Only 20 are AM stations with the remainder FM stations. Nearly two-thirds of the FM educational stations are licensed to colleges and universities, about one-fourth to local school districts, and the remainder to State agencies, high schools and non-profit educational organizations. Unlike ETV broadcasting, Federal assistance in the construction of facilities is not available. Nevertheless, half of the stations have been activated in the last decade.

It is very important to note that almost one-half of the educational radio stations are of the very low power 10-watt variety which have a range of not more than 2 to 5 miles, typically. The low cost 10-watt stations are for the most part incapable of providing for other than the institutional needs of the sponsoring schools and colleges.

With some notable exceptions, noncommercial radio has not adjusted to technical or social change. Nevertheless, because of technical assets, noncommercial radio broadcasting appears to be capable of great service in meeting community needs. It provides an unusually low cost channel to the home. The initial activation of a substantial FM station, serving distances 50 to 75 miles costs on the average less than one-twelfth that of a television station serving an equal distance. Annual operating costs are in the same ratio. Nationwide coverage by noncommercial

radio broadcasting can be provided for approximately $25 million, while educational television nationwide will require over ten times that amount. Radio is conveniently programed and easily used by administrators and agencies seeking broadcast services into the home. The interconnection of stations costs a fraction of the amount required for television interconnection. Inexpensive battery operated transistorized receivers are widely distributed and can be made available for special purposes. Recent improvements in technology add to radio's potential.

A Statewide network of multiplexed noncommercial broadcast stations could be utilized for many social purposes. For this reason, the Federal Communications Commission is rethinking its current policy for licensing educational radio stations. This kind of comprehensive development will not be seen in most States until some time in the future, however, and then only under favorable circumstance. For the moment, noncommercial radio must be regarded an important and useful medium in some locations, but being utilized at far short of its potential for community service in most locations.

Federal Policy and the Radio Spectrum

By the late twenties, the unregulated use of the limited radio spectrum had produced only chaos and licensing procedures were established. Since 1934, the Federal Communications Commission has exercised control over that part of the spectrum available for general public use. In its policies toward authorized users the Commission has shaped the character of educational broadcasting services today. It has sought, over the years, to encourage effective use of radio and television broadcasting

frequencies by educational institutions. Repeatedly, the Commission has acted to withhold from commercial development radio and television assignments, reserving them for education.

In 1938, the Federal Communications Commission set aside certain high frequency AM radio assignments for future educational stations. As part of a general adjustment of the spectrum in 1945, educators were shifted to space in the new FM radio section. Seeking to encourage development the Federal Communications Commission in 1948 authorized low powered operation for educators, the 10-watt station. Thus schools and colleges were able to go into radio broadcasting for a small investment, as low as $2500. It was hoped that once started these small operations would grow, mature and become useful to the community as a whole.

However, experience has been such as to raise a question as to the effectiveness of this policy. 2/ An educational radio service dominated by stations broadcasting only a few miles and with limited resources behind them--often, in fact, operated entirely by unpaid students--was not a medium that could be utilized to perform the varied services required by the general public. The effect has been to provide an institutional service in most cases, with limited utility even for the colleges and universities who form the major body of licensees.

2/ The Federal Communications Commission has stated (Notice of Inquiry, Docket No. 14185): "These stations [10 watts or less] present certain problems. Operation with such limited power does not usually represent an efficient use of scarce spectrum space, since coverage is often limited to a few miles. In addition, while these stations are often high quality operations, presenting programing consistent with the educational purpose for which the noncommercial educational FM band is designed, in numerous instances it appears that they are really light entertainment media, similar to many commercial radio stations only without commercials."

In November 1966, the Commission presented for public discussion a proposal which would modify the earlier policy. Basically it was proposed to establish a table of radio assignments reserved for noncommercial stations which would provide for sufficient long-range FM stations to allow a Statewide radio service in every State. Additional FM radio station assignments in the major urban areas are also assured under the proposal. Thus in areas of heavy population more than one educational FM station could be established, making possible a choice of educational programs especially designed for the great diversity of cultural, economic, or educational groups in the area. This preliminary action by the FCC has already excited the planning of Statewide noncommercial systems in a number of States.

When television appeared it was recognized by the Commission from the experience with radio that non-profit educational groups would be slower in utilizing the new medium than would profit making commercial interests. Therefore, in 1952 certain channels were withheld from commercial development and reserved for use by educational institutions.

Television receivers shipped in interstate commerce after April 30, 1964, are required to provide for the reception of all television channels--14 through 83 in the ultra high frequency range (UHF) as well as 2 through 13 in the very high frequence range (VHF) to which almost all sets operating at the time were limited. Most channels reserved for education by the FCC are in the UHF range. Prior to the all-channel requirement, television sets manufactured to receive only the VHF range needed a special adapter to permit UHF reception. This discouraged widespread UHF reception capability and neither educational nor commercial interests used UHF channels to any extent. Today, with the distribution of all channel receivers growing, there is clear evidence of UHF development.

In June 1965, the Federal Communications Commission took action to more than double the channels reserved for education. A total of 508 UHF channels and 102 VHF channels were reserved. The Commission has stated that the reserved ETV channels assured opportunity for a Statewide ETV broadcast service in each State with the opportunity for two ETV channels in each of the 45 major cities. Thus a sound basis is provided for Statewide coverage in all States.

Commission policy has also encouraged the development of essentially private multiple channel services for institutional use.

After educational institutions use television for a time the desire often develops for simultaneous television instruction in more than one subject to more than one age group. It is impossible to meet these needs with broadcast stations. To offset the channel limitation, the Instructional Television Fixed Service (ITFS) was made available.

Popularly referred to as the "2500 megacycle service" the system is available only to educational institutions. Currently, a licensee may be permitted to have up to 5 channels of the 31 channels available in any given area. Such a licensee may, therefore, distribute five ETV programs simultaneously. Programs are transmitted point-to-point, from a production center to a specific number of fixed receiving installations. With this service several school buildings within a limited area may be linked together. However, the general public cannot receive the programs on standard home receivers. This private character is both the strength and weakness of the service. FCC engineers point out that ITFS is an institutional system and not designed to take the place of the broadcast station. It is expected that communities with sufficiently

large populations will be served eventually by both broadcast stations and by ITFS. The FCC is experiencing a strong demand for licenses from the Northeastern seaboard and other major urban areas, particularly from private schools.

Technological advances have made similar private institutional services available by FM radio. The FCC permits multiplex operation of FM stations. An important resource for public services is thus provided. The noncommercial FM radio station using multiplexing has the possibility of providing a broadcast signal to homes while programing perhaps as much as four additional services simultaneously to sets adjusted to receive the signals of the multiplex sub-carrier channels. While music may be broadcast to homes, the State Director of Public Health can be speaking to nurses in the field on sub-carrier channel A, Civil Defense training can be provided to Civil Defense workers on sub-carrier channel B, in-service training to teachers can be provided on sub-channel C, and elementary or secondary schools can receive programs on sub-carrier channel D. It is technically possible to operate the five programing services simultaneously on the FM frequency assignment. The costs involved are very low. Such a multiplexed service is available to all listeners with modified receivers who are within range of the broadcast signal. In contrast the 2500 m/c ETV service can be received only at fixed points with special antenna installations.

Thus Federal control of the radio spectrum has been used to promote Statewide ETV broadcast networks, a policy which may be extended to noncommercial FM radio shortly. In addition to broadcast services, private institutional educational services, by both radio and television, can be mounted which can provide for the distribution of multiple programs

simultaneously. It remains for State and local agencies to determine how best to use these limited natural resources in the public interest. As will be seen, State authorities are moving forward to exploit opportunities in educational television while taking little advantage of the opportunities in educational radio which have been much less clearly and forcefully presented to them.

Statewide ETV and Radio Networks

The Statewide network involves the placement and interconnection of stations in such a way as to allow programs to be beamed to all parts of the State. This capacity can be enormously valuable to the many public services that are directed or assisted at the State level.

State educational television network development began in 1955 with the organization of the Alabama State ETV Network. In contrast to commercial television, the State network is an important feature in noncommercial development. In operation or under construction are networks in Alabama, North Carolina, Georgia, South Carolina, Tennessee, Kentucky, Arkansas, Oklahoma, Connecticut, Vermont, New Hampshire, Maine, South Dakota, Nebraska, Minnesota, Utah, and Oregon.

In South Carolina, for example, a central ETV studio in Columbia, the capital city, produces and transmits materials. The production staff of 45 persons includes artists, writers, teachers, librarians, television producers, and television engineers. Currently 28 school subjects are taught by ETV. In addition, regular Statewide continuing and professional education has been provided for doctors, dentists, nurses, pharmacists, lawyers, welfare caseworkers, law enforcement officers, and others.

Industrial supervisors and management personnel are assisted by ETV and industrial skills have been taught. Not only is the ETV network seen as related to the industrial development of the State, departments of government use the facilities for in-service training, administrative discourse, and public information.

The method used by South Carolina for distributing the materials produced is unique. A six channel closed-circuit system provides access to 700 school outlets interconnected by leased lines and microwave in the manner of a telephone system. One "at home" service is provided by signals from ETV broadcast station transmitters. Statewide broadcast coverage will be complete by the end of 1967.

Every State, in fact, is unique in the way it has applied ETV technology to its needs. Kentucky now has twelve transmitting stations under construction which will be programed from five studios within the State. The Alabama system has seven transmitting stations and three studios, two provide cultural programs and higher education instruction while a third studio provides public school instruction. In Utah, a broadcasting station at the University has programs extended to the State's population by translators or repeaters owned by local school authorities. The Vermont and New Hampshire systems each program a number of transmitter stations from a single studio at the State University. In Georgia, a State Department of Education production center produces public school programs for six transmitter stations which, along with the five stations under construction, will provide signal coverage over the State; the University producing station supplies the cultural and higher education materials.

Federal policy has sought to provide incentives for State and local agencies to work out their own formulations for ETV broadcast development.

The technical variety of the State ETV networks is as great as the variety of patterns under which networks are administered. Currently, 44 States have a formally designated State educational television authority. There are a wide range of approaches to the coordination of ETV broadcast services.

In Alabama, the State ETV Commission manages the transmission system while production facilities are controlled independently by particular schools and universities.

In Georgia, the State Department of Education operates a Statewide network, while the State University and the Atlanta Public School System operate independent stations.

In Vermont, New Hampshire, and Maine, State universities operate the State networks.

In South Carolina, a State Commission operates and assists in preparing courses for a Statewide closed-circuit system, and broadcast service.

In Oregon, the body which coordinates higher education is the ETV authority.

In California, an ETV Advisory Commission is housed in the State agency for administration and finance.

In Kentucky, a State ETV Commission is currently constructing a 12-station ETV network which it will operate.

In Nebraska, a State ETV Commission makes policy while network operating functions are delegated to the State University.

In Minnesota, a State network is developing under private control and no State ETV authority exists.

In Maryland, the State Deparment of Education directs school program planning while a State ETV Commission is responsible for general audiences and cultural programing.

In New York and Pennsylvania, independent regional agencies have been developed under State plans.

And, in a number of States, independent stations operate without influence of State plan or advisory authority.

The development of educational television by the States is an outstanding example of the creative variety and pluralism possible within the Federal-State partnership.

There have been three pressures prominent in the growth of State ETV networks. First, of course, has been the desire to equalize and extend educational opportunity and improve quality. The need for institutions of higher education to share high cost instruction, the importance of providing improved and rounded curriculum for the students of necessarily existent small schools, the shortage of trained teachers in many subject areas, and the difficulty for even the best trained teachers to keep abreast of rapidly expanding new knowledge, especially in the sciences, all these have encouraged the construction of broadcast stations and television network systems. Growth of networking is marked in areas with limited economic resources, in Upper New England and the South, where it has been recognized that standards need improving yet where the proportion of income going into education has been very high.

A second important pressure has been the drive for economic development. A little over a year ago in the State of Mississippi, the institutions of higher education were doggedly searching for some way in which to finance educational television. Today, a State network is well on the road to realization. The ETV system is a product of the State's drive for comprehensive economic development and the organized effort to evaluate and effectively mobilize all the natural, physical, economic and human resources of the State. Important elements in the effort will be shared educational television and computer services. The State ETV agency is an arm of the Mississippi Research and Development Center designed to promote a total environment in the State conducive to the orderly expansion of investment and employment opportunities so as to assure balanced community growth.

Educational television has been conceived in many instances as providing needed assistance for the training of manpower and the upgrading of educational and cultural opportunity to the end that industry would be drawn into the State and economic growth encouraged. The view is strongest in the South where organized efforts to attract industry are well developed. The Southern Regional Education Board, an arm of the Southern Governor's Conference, has been a major force behind ETV growth. Statewide coverage by ETV signals should be complete in all of the Southern States within two years. But economic programing is growing also in the urban centers. In Pittsburgh, Minneapolis-St. Paul, Seattle, Milwaukee, Chicago, and Houston, station schedules are being used increasingly by private business for the training and continuing education vital to effective industrial operations.

Third, and of equal importance, has been the pressure for cultural opportunity. Community groups and individual citizens, often from sparsely populated areas, have looked to noncommercial television as a channel for knowledge of the world and human affairs and as a way in which great art, music, and drama can be brought to them. In its early years educational television was often a disappointment in this respect, but it has been gaining increased stature. Financial and technical barriers continue to remain in the way of substantial amount of high quality programs. However, there is a growing conviction nationally that the increased resources required for greater excellence must be found.

After the ETV system has been established additional pressures can develop, it should be noted. Discovery grows that a noncommercial broadcasting television service is of unique value--to public service agencies,

for example. Perhaps it begins to be used for training of professionals or for direct services such as counseling parents of retarded children. These uses in most public service areas must be termed experimental, however. This is not because programing is untried by agencies which are outside the formal structure of education. Rather it is because State agencies usually lack the know-how to effectively use the medium and have still to pass through an apprenticeship before they will be able to exploit it fully in behalf of the human needs they serve.

In contrast to ETV only one Statewide educational radio network exists. Statewide educational radio coverage is provided in Wisconsin by a network of 11 stations. However, there is a renewed interest in State noncommercial radio networks sparked by the recent Federal Communications Commission proposal discussed above.

Why the contrast between television and radio network development? ETV is the superior medium in the sense that it unites sight and sound and, of course, receives more attention from an enthralled public. This is not the only reason, however. Radio, a low-cost medium, can be financed relatively easily out of institutional budgets. This includes both initial construction and operations of facilities. Television is much more costly, both for facilities and for operations. This forced educational institutions into coordination and directed attention to State government for support. In addition, television devours spectrum space. State planning was encouraged because of the fewer channel assignments.

Yet when noncommercial radio is judged in terms of benefits as they relate to costs, many opportunities for service can be seen for radio networks given proper organization, leadership, and the creative

application of new technological opportunities. The rise of medical radio networks is an example of the creative exploitation of some of radio's unique capacities. WAMC, the Albany Medical College Station (Albany, New York) provides a two-way radio conference network which uses faculties from 17 medical colleges to direct instruction to participating groups in 60 hospitals. The network covers 100,000 square miles and includes major portions of New Jersey, New York, Massachusetts, New Hampshire, and Vermont. Similar networks are now used by the Pennsylvania Hospital in Philadelphia, Pennsylvania, the University of North Carolina School of Medicine, the University of Utah College of Medicine, the San Francisco Medical College of the University of California, and the Ohio State College of Medicine.

The use of multiplexing gives to radio broadcasting a unique capacity for administrative services which cannot be duplicated by any other medium. It will require time for an appreciation of the potential of this relatively new development to sink in. This is especially true because the kind of work multiplexing can accomplish is far different from that which the noncommercial broadcaster has previously performed or is trained to consider as part of his function.

Federal Support of Research and Development

Congress has been very conscious of the importance of preserving State and local initiative in programs related to education. This has been especially true when educational television is involved.

The first use of Federal support for the development of the new electronic media was under the National Defense Education Act of 1958 (P.L. 88-665). Under Title VII of the Act, funds were made available

to State and local educational entities for research and demonstrations in the use of "newer educational media." Funds were provided to develop new knowledge as to the use of such mediums as television and radio and to make this knowledge available to local decision makers.

Title VII has been important in the search for solutions to some of the problems of educational television as it grew. Improvement in program distribution machinery was needed. As broadcast television began, commercial stations were almost immediately supported in their programing by the powerful production and distribution system already in operation for radio. Educational stations were largely without established material distribution systems. Under Title VII the establishment and pilot operation of a national instructional tape library was supported. New regional libraries of instructional materials were field tested. One of these, serving the Great Plains region, is today located at the University of Nebraska and the other serving the Northeastern region is administered by the Eastern Educational Network, Boston.

There was and continues to be evidence of a serious shortage of the ETV personnel, particularly at the management and engineering levels. The report of a survey of personnel in educational television, prepared by the National Association of Educational Broadcasters under a Title VII contract, identified the pool of manpower currently available and pointed to a growing shortage of personnel. The adequacy of professional training curriculums has been questioned. Two contracts awarded, one to the University of Pittsburgh and the other to Alameda County (California) State College were designed to formulate guidelines for the training of educational media specialists, including ETV personnel. It was and continues to be clear that new techniques and sources of operating financing

need to be developed. Two conferences supported under Title VII, one at Brandeis University in 1963 and second at Washington in 1964, explored the problem.

Title VII also supported a substantial number of studies seeking to measure the effectiveness of educational television as a medium for instruction. Additional investigations have been supported by the Public Health Service and the Department of Defense. The major private contributor to the body of knowledge about ETV is the Ford Foundation, with over $100,000,000 invested to date. Many other non-profit foundations have made important contributions.

In all, over 400 comparative studies have been made. Generalizations supported from research and demonstration findings include these: (1) Television can effectively teach a wide variety of subjects to students at every grade level. (2) Television is an effective means for expanding educational opportunity in a variety of situations. (3) Television effectiveness for education is influenced by and dependent on many factors including receiving environment, viewer preparation, and follow-up activities. Television is not a panacea. But television can often be of assistance in meeting important community objectives.

As a result of completed research and demonstration, the question is no longer, "Can television be used for educational purposes?" Rather the questions are, "When, how, and for what objectives should the medium be used?"

Federal Support of Broadcast Facilities

When under the Educational Television Facilities Act (P.L 87-447), signed May 1, 1962, Federal funding was made available for the construction

of educational television broadcasting stations, Congress made certain that there should be no involvement by the Federal government in programing.

"Federal Interference or Control Prohibited

Sec. 397. Nothing in this part shall be deemed...to authorize any department, agency, officer, or employee of the United States to exercise any direction, supervision, or control over educational television broadcasting or over the curriculum, program of instruction, or personnel of any educational institution, school system, or educational broadcasting station or system." 3/

Under the Act matching funds are provided to assist in construction of new noncommercial television broadcasting stations or the expansion of existing stations. Matching grants, up to fifty per cent of the project cost (or up to seventy-five per cent under particular circumstances) are for the acquisition and installation of transmission apparatus. Over $12 million was obligated in FY 1966.

A statutory limitation of $1 million was established on the amount of the $32 million authorized which could be distributed within a State. States in which the maximum had been granted by the end of 1966 were Alabama, California, Georgia, Tennessee, Kentucky, Florida, Illinois, Minnesota, South Carolina, New York, Pennsylvania, Nebraska, and Washington. 4/

3/ Educational Television Facilities Act, Public Law 87-447.

4/ Grant approvals under P.L. 87-447 within Minnesota include: Duluth-Superior Area Educational Television Corporation--Activation of Channel 8 (December 9, 1963), $212,625; Twin City Area Educational Television Corporation--Activation of Channel 17 - St. Paul (June 20, 1964), $154,255; Twin City Area Educational Television Corporation--Activation of Channel 10 - Appleton (September 4, 1965), $168,719; Twin City Area Educational Television Corporation--Expansion of Channel 2 - Minneapolis-St. Paul (June 16, 1966), $363,986. Application is currently pending from Duluth-Superior Area Educational Television Corporation--Expansion of Channel 8, $101,145.

Total ETV broadcast equipment investment in the United States has been estimated at $80 million. The provision of an ETV signal to approximately 95 per cent of the population within each of the States will require an estimated capital investment of between $350 to $400 million depending on the character of the State system developed.

The Carnegie Commission on Educational Television is expected to report in early 1967 with recommendations for improvement and expansion of ETV broadcasting. This report is being awaited with great interest.

The object of the current Act is to provide for facilities which would "serve the largest number of persons and serve them in as many areas as possible, and which are adaptable to the broadest educational uses." 5/ By early 1967 all but three States--Alaska, Montana, Wyoming--will have under construction ETV broadcast facilities with the help of Federal grants. When the Act was signed, 63 stations were in operation; with the completion of supported construction over 175 stations are expected to be broadcasting. Today, ETV coverage has been extended to included a minimum of 140 million people, of which at least 40 million have ETV broadcasting newly available as a result of grant supported projects. An additional 5 million school children are having some part of their instruction supplied by television as a result of Federally assisted construction. In short, the Act is accomplishing what it was designed to accomplish within the funds authorized.

Subsequent to passage of the Educational Television Facilities Act, additional school and college legislation has provided opportunity for funding of ETV facilities. However, this support has focused on the

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5/ Educational Television Facilities Act, Public Law 87-447.

development of institutional needs and institutional communication services rather than broadcast services.

The Higher Education Act of 1965 provides funds to institutions of higher education for closed-circuit or Instructional Television Fixed Service (2500 m/c) equipment. Determinations as to the distribution of funds within a State are made by appropriate State authorities. A total of $1.5 million was made available for equipment in FY 1966.

Under Titles I and III of the Elementary and Secondary Education Act of 1965 closed-circuit and 2500 m/c equipment may be funded if they meet the objective of the Act. Under Title I, support is provided for projects to assist culturally deprived children. Determinations are made by the State authorities. Although the program is concerned primarily with the support of educational activities, some equipment has been included in supported projects. Closed-circuit and 2500 m/c systems have been funded for this educational purpose. An estimated $20 million went into television projects in FY 1966. Under Title III, radio and television equipment and programs may be supported. However, current policy frowns on funding construction of facilities. Rather than "brick and mortar" or "hardware" purchases, emphasis is placed on operating activities which directly involve students.

Federal Funding of Innovation and Improvement

During the last two years a wide variety of support programs designed to improve professional training and services to the public have funded projects using educational television. While Title VII, NDEA was designed to encourage study of new media techniques, the purpose of projects funded under the various service programs is to encourage greater

effectiveness in providing particular public services. Within the Department of Health, Education, and Welfare, programs have used ETV which are administered by the Public Health Service, the Office on Aging, the Vocational Rehabilitation Administration and the Welfare Administration. Other agencies such as the Small Business Administration, the Department of Justice and the Department of Agriculture have also assisted projects utilizing educational television communications.

Almost every public service has a number of comparable unsolved problems: the limited number of trained professionals, a greatly increased body of knowledge, an increased need and demand for services, and an increased emphasis on public self-reliance assisted by sound public information.

Noncommercial broadcasting has important potential for the solution of these problems. It can serve basic individual needs. It can provide mental health information, assist employment opportunity, distribute programs to combat social problems auch as alcoholism, juvenile delinquency, illiteracy, as well as programs to prepare people for problems of age and make life adjustment after 65 easier; and it can make available sound nutritional and preventive medical information. Educational television and educational radio can also be used to improve the effectiveness of public services. It can train nurses, doctors, police and other professionals. It can provide needed public information about our community; a high level of public cooperation and awareness is needed if programs in Civil Defense, air and water pollution, and community health are to pay dividends. Finally, ETV can assist in strengthening economic resources through improved skills in business, farming, homemaking and the professions.

However, professionals--the welfare caseworker, the rehabilitation worker, the public health specialist--have not learned to any great extent how to effectively use the newer techniques. The media specialist furthermore lacks familiarity with the needs and purposes of programs in welfare, Civil Defense, agriculture, and commerce. As a result, we are now in a period of trial and error in which specialists are seeking ways to blend their talents.

There is an array of Federal programs designed to improve existing professional services. These are helping professionals become familiar with the newer media and are accelerating the rate at which ETV will be put to work. The selected examples of funded projects which follow demonstrate the wide range of professions and areas of service now exploring the use of television.

> A series of television programs to educate the public on the complicated nature of mental illness and roads to recovery has received Federal support. Films will describe misconceptions about mental illness, changing methods of treatment, intensive hospital treatment, the half-way house, day care program, and sheltered workshops. (Chicago Educational Television Association, Chicago, Illinois)

> A funded demonstration seeks to use television programing to assist older persons in living a more complete and satisfying life. It calls for broad community participation to assist in providing information most useful to older Americans as well as satisfying cultural entertainment. (South Central Educational Broadcasting Council, Hershey, Pennsylvania)

> A funded project provided in-service training of welfare caseworkers by means of a Statewide television network. A feature was the use of trained teachers, not available in the State served by the programs, who were staff members of a major University in a nearby State. (South Carolina ETV Center and State Family Services Agency, Columbia, South Carolina)

A closed-circuit television connection between a University Medical Center Psychiatric Institute and a semi-isolated State mental hospital is being supported, demonstrating ETV used to provide improved patient diagnosis and treatment, to facilitate research, to improve training of professionals, and to provide special services to patients and their families. An example of the latter are the visitations by means of television between patients and family members separated by many miles. (Nebraska Psychiatric Institute, University of Nebraska College of Medicine, Omaha, Nebraska)

A series of one-hour instructional programs and appropriate materials to train food handlers were supported by grant. Food poisoning effects millions of persons each year, resulting in an unnecessary economic drain. A Statewide television network was used to train food handlers in sanitation practices recommended by the Public Health Service. (South Carolina State Board of Health and South Carolina State ETV Center, Columbia, South Carolina)

A study was made into the efficiency and effectiveness of using broadcast television in a national program of postgraduate medical education. A test system including several medical institutions and educational television stations was established for evaluation. Study was focused on: effective instructional materials, learning motivate techniques, active versus passive participation while learning, and concentrated versus spaced television presentations. (University of California, San Francisco Medical Center, San Francisco, California)

Programs were funded to combat the many stereotyped attitudes about mental illness and its treatment still prevalent today. The special television series on the substantive research in mental health was designed to give the layman greater insight into human behavior. In addition, the programs sought to apprise professionals in mental health and related fields as to some of their colleagues' newest approaches. Through educational television information current knowledge on the potential for future advances was to be provided to lay and professional viewers. (National Educational Television, New York, New York)

An effort was funded in which television techniques were to be studied to reduce the gap between available medical knowledge and its application in practices. Television has the potential of reaching the 80 per cent of physicians who do not take part in established postgraduate educational programs. ETV facilities are available and can reach 90 per cent of the physicians of Maine. Using television programs augmented by live question and answer periods using telephone trunk lines, the medical talents of a major urban center were used to provide service to a sparsely populated State. (Bingham Associates Fund in cooperation with Massachusetts Medical Society, Maine Department of Public Health, and WGBH, Boston)

Educational television broadcasting was to be used in an effort to assist in increasing employment opportunity for low employment groups. A project was funded to develop ETV programs for the dual purpose of teaching the English language and offering vocational education to Latin American members of a major urban area. Production techniques to attract and hold the target audience, principally teen-agers and young adults, but including the entire family group, were to be examined. Programs were to explain vocational procedures and working conditions. Potential jobs were to be presented as goals within reach of the viewer. The project was to be evolved with the cooperation of employers, schools, unions, ethnic newspapers and organizations, and welfare and social agencies. (Bay Area Educational Television Association, San Francisco, California)

The preparation of a series of television programs was funded to provide job information and occupational guidance for students and prospective students of vocational education. A principal purpose was to inform disadvantaged minority groups of new and varied career opportunities now possible in representative businesses. (San Bernardino Valley College, San Bernardino, California)

Funds were provided for the development of television lessons in pre-service and initial in-service training for vocational teachers. The feasibility of presenting training by means of television to the 24 area vocational schools in a State was to be examined. (Minnesota State Department of Education, Division of Vocational Education, St. Paul, Minnesota)

The utility of educational television as a means for raising levels of awareness and information among selected disadvantaged populations in specific areas of health, social service, employment, and family finance was to be studied through a funded project. A sample of disadvantaged families residing in public housing developments was to be selected and their responses to particular television programs measured. (University of Denver, Denver, Colorado)

Television as a teaching medium was to be used in an approved project to counteract some nursing educational problems in a State with large area and low population. Television video tapes were to be utilized to extend instructions by well qualified faculty on a University campus to students located in campuses 150-200 miles distance. (Montana State University, School of Nursing, Bozeman, Montana)

A history of nursing series, under an approved project, was to be shared through television by four schools of nursing. Additional schools outside the area of the ETV broadcast signal were to have kinescopes available to them. (St. Barnabus Hospital, School of Nursing, Minneapolis, Minnesota)

Funds were provided to link 18 metropolitan schools of nursing by means of telecast courses including "Legal Aspects of Nursing," "Current Trends in Nursing" and "Growth and Development." (Evanston Hospital, School of Nursing, Evanston, Illinois)

A project was funded to improve a program for graduate nurses, by exploring the effects of substituting remote control live television observations of nursing situations for the traditional clinical experiences. (Los Angeles State College, Department of Nursing, Los Angeles, California)

To adjust to increasing enrollments a funded project sought to develop equally good or better television techniques for teaching large groups in a course traditionally taught in small lecture-demonstration classes. (University of Washington, Seattle, Washington)

An ETV series was funded to inform large numbers of people as to the nature of alcoholism, and thereby assist in combating it and reducing its drain on productivity. These programs were directed not only to alcoholics but to those who are associated with persons who are alcoholics and to the general public that may someday have to deal with the problem. (Chicago Educational Television Association, Chicago, Illinois)

In the process of funding projects involving new uses for educational television, there will be failures as well as successes. Some uses will attract attention, be imitated, modified, and grow in importance. Others may never be heard from again.

State, regional, and local institutions, in partnership with Federal agencies, have been involved in ETV demonstrations for less than a decade. Thus far, private sources have provided the greatest share of dollars for demonstrations projects. However, the last two years has seen a great increase in the Federal support of State and local ETV projects. This trend will probably continue as greater experience develops under the new programs and as interest in ETV expands.

State Telecommunication Planning

The growth in the variety of available communication services and in a complex society's demand for these services is bringing before more and

more States questions of planning and coordination. The reactions by States are not uniform and in only a few cases has a comprehensive attack on the problem been made. However, recognition of the problem is increasing.

There are both technical and functional reasons for the emergence of State telecommunication planning efforts. On the technical side, the interconnection of locations, either by leased common carrier services or by user-owned microwave systems, is costly. Utilization of such facilities for more than one purpose usually can provide for more economical communications as well as increased reliability of the service through shared operating costs.

An example is the joint use of interconnection facilities by ETV and by computer services. The "interdependence of computer and communication services and facilities" has caused the Federal Communications Commission to give special attention to regulation and policy questions which may arise from what the Commission has termed "the growing convergence of computers and communication." 6/

In at least one State telecommunication planning study, this one for the Governor's State Communications Committee of South Dakota, the consulting engineers recommended cooperative development of interconnection facilities for educational television and data processing services. The engineering report notes that the amount spent by the State for data processing rental, if invested in a centrally located data processing center, could provide all State agencies with facilities available to only 1 of 127 South Dakota agencies. However, such a data processing system would require a communication system between the central location

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6/ "Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities." (FCC Docket No. 16979)

and outlying users. South Dakota's previously commissioned educational television network study proposed to interconnect educational television stations over the State. "In order to obtain the greatest economic efficiency for a microwave system," the engineers' report states, "It is necessary to carry as much information, communication, and data as possible. Statewide coordination between department and agencies is mandatory if costs are to be kept in bounds...Interconnection by microwave of the educational productional production and transmitting centers can be accomplished sooner and at less cost if a cooperative effort is made to meet the needs of State radio and data processing requirements." 7/

In another study, this one supported under Title VII, NDEA, the establishment of multi-purpose electronic interconnection service was examined involving groups of colleges and universities, among them the Big Ten institutions. In the latter case a common use of interconnection facilities by the many departments and agencies of these institutions was recommended. The system would be capable of serving a variety of terminal equipment including facsimile, slow-scan television, telephone with assorted devices, radio, teletype and also, under certain arrangements, core-to-core computer transmissions and broadcast quality television service. 8/

In addition to cost factors, cooperative utilization of communication facilities may often assure the availability of a broader range of communication services than would be possible under a single agency service. The opportunity can exist for closer tailoring to the needs of

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7/ Communication System Planning for the State of South Dakota (1965) pp. 25, 27, 30.

8/ Educational Communications Systems: Phase III, National Association of Educational Broadcasters, Washington, D. C. (October 1966)

health education, and community agencies. This is not inevitable, however. Much depends on the quality of telecommunication planning--the recognition given to the unique requirements of special services in the course of it--and the effectiveness of continuing management. Many agencies uncertain of the quality of a joint user system not under their direct control, are fearful that service will not be reliable or suited to needs and, therefore, prefer to operate agency controlled "one horse" systems whatever the limitations.

However, growing demand for service, growing sophistication of equipment and mounting costs will make increasingly essential the overt and sustained attention by States to the coordinated development of communication services. An example of what lack of planning can mean in cost to the taxpayer is in the failure by States to use currently available telephone rate advantages. A recent review of leased facilities found that 27 States are contracting for services at a commercial rate averaging approximately $4.00 per month for voice channel mile, while 19 States utilize State Telpak arrangements at costs which average between $1.00 to $1.50 per month and 12 States utilize Federal Telpak rates averaging 45 cents per month for voice channel mile.

In the long run much more important than poor purchasing of leased services is the go-it-alone practice of State agencies when developing and operating their own systems. Experience has shown that common user systems (joint use of a communication system by many agencies) are generally more effective and less costly. In the proliferation of independent dedicated systems there are the dangers of under utilization, lack of versatility and responsiveness, and an incompatability of systems one with the other.

The Director of Telecommunication Management in the Executive Office of the President has provided advisory assistance to States preparing plans for communication services. State action is being sparked from several quarters. There is the demand for educational television. Also in the forefront are needs for reliable and responsive communication systems in time of natural or nuclear disaster and for improved report systems in law enforcement. In addition, there is the growth of library and information retrieval functions for business, education, and the professions, the increased importance attached to health information and the need for effective report systems in the control of disease, and the rise in communications requirements, generally, in the administration of increasingly large enterprises.

As a result of such pressures Federal programs are contributing to State problem solving efforts. State and local agencies are exploring or using a variety of resources. (1) The Office of Civil Defense can provide matching funds for capital costs of communications systems which will enhance the capability for State and local government agencies to carry out their defined Civil Defense emergency responsibilities. (2) The State Technical Services Act of 1965 (P.L. 89-182) can support State and inter-State efforts that enable businesses, commerce, and industry to acquire and use scientific and engineering information more effectively. The Act suggests such means as the dissemination of recorded technical information and the use of computers and communication links is receiving major attention in these efforts. (3) The substantial number of Federal Acts supporting extension and improvement of library services are encouraging greater coordination between the interconnection of

libraries and increased attention to automation and computer application. 9/ Thus far, applications of cummunication technology to library administration has been more a matter of projection than of fact. Nevertheless, there is no question that the information explosion demands greater sharing of services, centralization of resources, and with it improved communication systems. Increased resources are available to meet these goals. (4) There is an expanding interest in improved medical communication and information retrieval to meet the ever greater opportunity for improved health services. Planning and demonstrations have been funded for systems to meet a wide range of health improvement objectives. (5) Finally, there are the many new educational programs, discussed here at several points, which have authority to provide for communication planning for particular educational purposes.

It is true that the objectives for which funds are appropriated do not allow for the total support of comprehensive planning by States of communication facilities. Yet experience shows that where there is creative and dynamic State leadership, backed by State funds appropriated for telecommunication planning, the added support available from these Federal sources can be very beneficial.

Approximately one-half of the States have taken steps which grow out of an awareness of developing communication problems. States which

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9/ Federal support for libraries is available from a great variety of sources to meet special objects. Legislation includes: Elementary and Secondary Education Act of 1965 (P.L. 89-10); Library Services and Construction Act (P.L. 88-269); National Defense Education Act-Title II (P.L. 88-665); Vocational Education Act of 1963 (P.L. 88-210); Higher Education Facilities Act of 1963 (P.L. 88-204); Higher Education Act of 1965-Title II (P.L. 89-329). Special libraries are assisted under the Medical Library Assistance Act of 1965 (P.L. 89-291) and the State Technical Services Act of 1965 (P.L. 89-182).

have undertaken major studies aimed at the coordination of communication facilities include: California, New York, Nebraska, South Dakota, South Carolina, Pennsylvania and Virginia.

In general, the problem calls for (1) a survey of present public services and future public needs for services, (2) a survey of existing facilities and plans for expansion, (3) an analysis of needed changes, and (4) a plan for continuing attack on the problem.

In reality each of the telecommunication planning efforts are representative of the special pressures and individual leadership within the State. Planning objectives have often been limited, of necessity, because of the purposes for which funds used were appropriated. The creative force behind them have been the State ETV program, the Civil Defense program or the State Office for Adminstration, usually in combination.

Every State, of course, has its unique problems and no two States will approach communication planning the same way. Nor will any two States come up with the same solutions. However, in order to illustrate the comprehensive character of the planning involved, the initial efforts of a typical Midwestern State, Nebraska, will be described.

Nebraska included for consideration all types of communication services. Governor Frank B. Morrison stated at the time a State Committee was activated, "Technical development available to meet our future requirements for radio, teletype, facsimile, telemetry, closed-circuit TV and other communications means presents us with a real challenge in meeting our extensive requirements for day-to-day operations, as well as assuring effective and coordinated communications in times of emergency." 10/

10/ Communications for Nebraska State Government. A survey and report concerned with feasibility of a Statewide communications network including system concept and design parameters. (November 12, 1965) p. i.

A Nebraska State Government Consolidated Communication Committee was activated. Every major department of government was represented in the planning.

When the Consolidated Communication Committee surveyed their existing Statewide communication systems they found the following services operating side by side:

> Safety Patrol: a two-way radio communication system consisting of multiple main stations located throughout the State requiring the operation of 28 separate transmitting sites as well as 247 mobile units in service.
>
> Department of Roads: a two-way radio system operating throughout the State from eight divisional office headquarters and from the main headquarters in Lincoln. The service involves operation of 21 separate transmitting sites and 183 mobile units.
>
> State Public Power: a two-way radio system involving 62 base stations, 21 separate transmitting sites, and 245 mobile units.
>
> Game, Forestation and Parks Commission: a Statewide system of VHF mobile repeater and control stations with 15 separate transmitting sites and 118 mobile units.
>
> National Guard: a VHF radio system on military frequencies with transmissions from 29 national guard installations and utilizing 148 vehicle mounted radios.
>
> Civil Defense and Sheriffs Network: the 84 county sheriffs have base radio stations and 181 mobile radios are involved.
>
> National Communications Systems; Military bases and Federal Agency Field Forces are linked together by wire and radio.
>
> Educational Television: a nearly complete Statewide broadcast network involves six ETV stations and a number of supporting translators or repeaters. 11/

When a study was made of the future requirements of the State agencies it was concluded by the independent engineering firm retained by the Nebraska Committee that necessary services "could well exceed $15 million if developed by and for the use of the individual agencies...In all

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11/ Op. Cit. pp. 15-17.

probability, the expressed needs would never be fully developed for reasons of prohibited costs on a Department 'go-it-alone' basis. On the other hand, one can be sure that many of the services will be individually developed and funded for reasons of forced requirements in the future." 12/

Engineering council further concluded, "If facilities are established on a 'joint use' basis, it is within reason to assume that funds now being used and projected for communication services could provide for these necessary services if properly consolidated and programed." 13/

The Nebraska study is one kind of comprehensive examination of a State communication problem. It is not presented here as a recommendation, for each State will have a unique combination of considerations--terrain, needed services, administrative structure, and individual leadership.

Coordinated planning of State communication services does not need to mean centralized operation. In all probability it will not mean that. It will not do away with independent communication systems where important functions are served by separation. Thus far efforts at coordination have tended to focus on an electronic "backbone' within the State for long distance transmission, designed to serve many agencies and a variety of communication tools. The backbone system should increase the opportunity for a public service to develop the communication system most suited to its needs.

Any planning effort will fall far short of its effectiveness if it fails to consider and allow for the uniqueness found in each form of communication. The unique character of broadcasting has been stressed, its ability for all practical purposes to provide programs anywhere within

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12/ Op. Cit. p. 22.

13/ Op. Cit. p. 22

range of its signal and the limits which the radio spectrum places on ultimate growth. This uniqueness has been recognized by the States in the independence they have given to the development of ETV through a variety of commissions and authorities. It has been overlooked, however, in the case of radio broadcasting which has not, with the one exception, been utilized by the States.

Effective State planning cannot proceed in isolation if it is to bring the return it should. There is a growing amount of planning looking toward the development over the next decade of a number of kinds of specialized regional and national communication networks or institutional interconnections. The interconnection of medical centers by means of satellite has been suggested. A number of projects are under way looking to the national interconnection of libraries for services in particular subject areas. A State transmission service, properly conceived, could extend generally over a State the resources of new national information systems that might otherwise be available to only one location within the State.

Communication systems are rapidly changing. This change is likely to accelerate rather than slow down. A plan or a study is not enough although it can be a good opening attack on the problem. Effective planning and management of the communication needs of a large an enterprise as a State will require continuing direction at a high administrative level. The technology, the State administrative framework, the service requirements, the individuals involved will change over the years. Expertize must be available in some depth. Leadership functions need to extend beyond the creation of communication systems to the stimulatory efforts required to assure effective and efficient utilization of these systems by public agencies.

Unfortunately the communication problem in State government has all too often been considered as a routine housekeeping function largely built around the assurance of uninterrupted telephone service.

While the States are beginning to undertake comprehensive telecommunication planning there are the usual administrative and human problems. The task will become increasingly important and worthy of effort. On one hand if poorly planned and used, communication systems can reinforce inefficient government and fail to contribute to contribute to greater excellence of services. On the other hand, well-planned telecommunication systems intelligently used can enormously increase the effectiveness and efficiency of government services; they improve educational quality and opportunity and contribute to the economic development of a State. The States which take seriously the opportunities provided by communication technology and seek to exploit them will be amply rewarded with a better life for their citizens.

CONCLUSION

Over the last decade educational television broadcasting has become an established institution in the United States. Facilities have been developed generally over the country initiated by State, local, and private agencies using financial assistance from the Federal government. The Statewide ETV broadcast network is emerging as an important institutional structure.

Federal assistance since 1958 for research and demonstration projects in educational television has increased knowledge as to the effectiveness of television for educational purposes. In the last three years television techniques have been supported by a number of health, education,

and community programs which provided assistance for improvements in professional training and for the development of more effective methods of public service. These funds have not been used to construct facilities, except incidentally, but have flowed where facilities already exist.

Educational television broadcasting has become an important part of the growing interest at the State level in coordinated development of communication systems. While the movement is in its early stages it appears that it will grow. States which aggressively plan for and exploit the new communication resources will assure a better life and greater opportunity for their citizens.